

U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

INFRASTRUCTURE

Pooled-Fund Study To Validate Geotech Device

On November 29 and 30, FHWA sponsored a meeting to kick off the validation of a new device that measures the stiffness of compacted granular materials called the Soil Stiffness Gauge (SSG). Preliminary studies indicate the SSG can be used to control the compaction of soil for roadway construction, particularly in trenches, embankments, and behind abutment walls. The validation is being conducted as part of the pooled-fund study, "Non-Nuclear Testing Of Soils And Granular Bases Using The Geogauge."

Successful validation of the SSG should improve the method for controlling the compaction of soils for highway construction and make it possible for the soil stiffness or modulus measurement to be directly applied into the design of pavements or in the forensic failure analysis of soil structures.

Currently, the most popular method of controlling soil compaction is to measure the density of the soil with a nuclear density gauge. The use of the nuclear density gauge is very inconvenient because it contains radioactive materials. The nuclear density gauge is also strictly



Melvin Main, who helped develop the device on the right known as the SSG, prepares the ground with a thin layer of sand to perform a soil stiffness test.

regulated and use requires special training, transportation documents, and provision for storage. Comparatively, the SSG does not require any special permits or license for use, and collects data quicker than the nuclear density gauge.

Twenty-two States are contributing to the pooled-fund validation study and representatives from each State were invited to participate in the November

meeting. Developers of the SSG and its manufacturer, along with several university professors attended the November meeting. The meeting was organized under the direction of FHWA geotechnical engineer Albert DiMillio, who has also collaborated with other government agencies and industries during the development of the device.

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RESEARCH & TECHNOLOGY TRANSPORTER

The *Research and Technology Transporter* communicates FHWA research, development, and technology accomplishments, findings, information, and technology transfer opportunities. Its audience is transportation engineers and professionals in State and local highway agencies, State DOTs, Local Technical Assistance Programs, Divisions, Resource Centers, Core Business Units, academia, and the research community. The eight-page newsletter is published monthly by FHWA's RD&T service business unit. Editorial offices are housed at the Turner-Fairbank Highway Research Center. Comments should be sent to the managing editor at the address below. Field offices are encouraged to submit articles for publication via the appropriate agency technology leader from the editorial board listed below. The newsletter can be viewed online at www.tfhrc.gov. Subscriptions to the *Transporter* are free. Send your request to Judy Dakin at the address below, or send email to judy.dakin@fhwa.dot.gov.

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Working Together to Mitigate Earthquake Damage

In 1999, two devastating earthquakes struck Turkey. The first, called the Kocaeli earthquake, occurred on August 17 and the second, the Duzce earthquake, occurred on November 12. Combined, the earthquakes caused at least 20,000 casualties and considerable damage to buildings and industrial structures. However, bridges performed well overall compared to buildings.

Soon after both earthquakes, FHWA's Offices of International Programs and Infrastructure R&D dispatched an investigating team to Turkey to cooperate with Turkish road officials in assessing the performance and behavior of structures. General Dincer Yigit, of the Turkish Road Directorate (KGM), embraced the opportunity for this cooperation, and was

(Continued on page 3)

Lessons Learned Workshop

From the beginning of the first trip to Turkey, FHWA engineers established an excellent working relationship with KGM engineers. This collaboration has continued and resulted in an agreement to offer a joint workshop on lessons learned from the recent earthquakes and on state-of-the-art techniques for mitigating the damaging effects of earthquakes on bridges. This workshop was presented to more than 100 KGM engineers, consultants, contractors, and academics in Ankara, Turkey from November 6 to 11, 2000. The workshop included lectures by the U.S. delegation, presentations by both the U.S. and Turkish experts, and a field trip to the damaged areas. The U.S. delegation comprised of FHWA engineers James Cooper (team leader), Hamid Ghasemi, Phillip Yen, and Derrell Manceaux who is with FHWA's Central Federal Land design office; CALTRANS engi-

neers Saad El-Azazy, Mark Seyed, Anoosh Shamsabadi, Mark Yashinsky, and Thomas Harrington; professors Frieder Seible from the University of California-San Diego, Issam Harik from the University of Kentucky, and Emin Aktan from Drexel University; consultants Roy Imbsen from Imbsen and Associates, Joseph Wang and Jon Kaneshiro from Parsons Brinckerhoff, and Mehmet Celebi from the U.S. Geological Survey.

This workshop was valuable to FHWA because it advanced knowledge of seismic engineering. For KGM the workshop provided long-term benefits to the Turkish highway program through the transfer of seismic technology. Both the KGM General Director Dincer Yigit and James Cooper were very pleased with the results of the workshop and agreed that engineers from both countries have benefited.

(Continued from page 2)

helpful in directing his staff and engineers to furnish technical information about each bridge and to provide access to all damage sites.

These sites were primarily along the Trans European Motorway (TEM) where there was minor to moderate damage to the bridges and viaducts. The exceptions were the Arifiye Overpass and Viaduct #1 where surface fault ruptures propagated between their piers. The Arifiye Overpass, a 4-span simply supported skewed pre-cast concrete bridge, located 50 km from the epicenter, collapsed during the Kocaeli earthquake. Viaduct #1, a dual 59-span simply supported pre-cast concrete bridge with a total length of 2.3 km, located 15 km from the epicenter, was severely damaged during the

Duzce earthquake.

The first FHWA team was comprised of three FHWA bridge engineers from the Office of Infrastructure R&D, James Cooper (team leader), Hamid Ghasemi, and Phillip Yen; CALTRANS bridge engineer Saad El-Ezazy; and consulting engineer Roy Imbsen. They spent three weeks in Turkey evaluating more than 50 structures on TEM and provided recommendations on the seismic safety of these bridges to KGM. The team also produced a technical report that summarizes their findings and recommendations.

A second team was dispatched to Turkey after the Duzce earthquake. This team consisted only of James Cooper and Hamid Ghasemi. They spent two weeks in

Turkey evaluating the damage suffered by Viaduct #1 and the Bolu Tunnel during the Duzce earthquake. The propagation of the surface fault rupture along and between the piers of Viaduct #1 and the fact that the viaduct had been constructed with energy dissipating systems provided a rare opportunity to study this structure. The subject of the near-field effect, i.e., the close proximity of the surface fault rupture to structures, and also the performance of the energy dissipating systems in protecting bridges from earthquake damage are under widespread investigation in the U.S. The team has written a technical report on their findings that is available on the FHWA Web site.

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FHWA's investigating team and Turkish road officials cooperated to assess the performance and behavior of structures.

Extending the Materials Reference Laboratory

This past fall, FHWA signed a new 5-year cooperative agreement to extend one of FHWA's longest partnerships. Since 1965, FHWA, 52 State highway agencies, and 2 other governmental agencies have jointly financed the basic operations of the AASHTO Materials Reference Laboratory (AMRL).

AMRL was established to promote adherence to standards in the testing of construction materials, particularly by State and FHWA laboratories. AMRL staff inspects laboratories at roughly 24-month intervals and regularly distributes proficiency samples to assess each laboratory's capabilities for

performing standard tests on soils, aggregates, asphalts, and mixtures of these materials. The AMRL also uses the resources of a parallel organization, the Cement and Concrete Reference Laboratory (CCRL), to evaluate laboratory performance of tests on cement and concrete.

Results of AMRL assessments provide FHWA with its only independent evaluation of States' (and its own laboratories') testing prowess. FHWA's division offices rely on the results of the AMRL program to administer the Federal-aid highway program. As a side benefit, AMRL evaluations improve the quality of testing for non-

Federal construction within each State.

The organization's staff, which operates out of laboratory space at the National Institute of Standards and Technology in Gaithersburg, MD, conducted inspections of 732 laboratories during the most recent 24-month tour and distributed more than 14,000 proficiency samples in the past year. AMRL also provides technical support for the AASHTO Accreditation Program, which has accredited over 500 laboratories across the United States.

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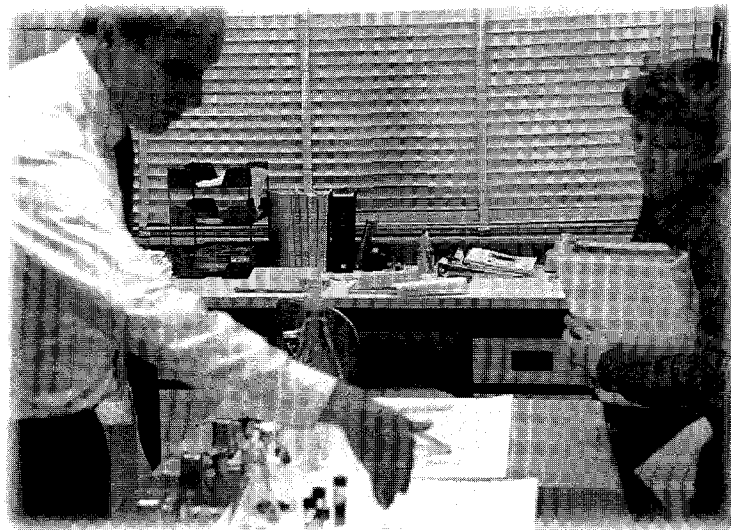
Asphalt/Concrete Workshop Builds Capacity

A training program on state-of-the-art asphalt and concrete pavement technology, including Superpave and High Performance Concrete, has been developed for FHWA resource centers; the Federal Lands Program office; and division office materials, pavement, and bridge specialists. A four-day asphalt/Portland cement concrete pavement, materials, and testing workshop was held during the week of December 11 at TFHRC. The workshop was organized by the Office of Pavement Technology and Research, Development, and Technology as a capacity building exercise between FHWA headquarters and field staff.

Twenty-six experts from FHWA resource centers and division offices attended the workshop, which provided hands-on training

on new pavement procedures, materials, and testing techniques. FHWA's mobile concrete and TFHRC's laboratories were used for the training session. The Office of Pavement Technology and TFHRC

asphalt and concrete experts provided the training. At the meeting, future plans were made to hold similar capacity building



New testing methods were demonstrated and explained in the TFHRC laboratories during the workshop.

activities on an annual basis.
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PLANNING AND THE ENVIRONMENT

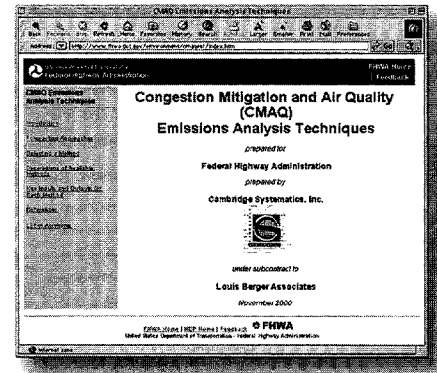
CMAQ Online

Need quick access to the latest emission reduction estimation techniques and measurement methodologies being used across the country? The Office of Planning and Environment is pleased to announce the Web release of the *Congestion Mitigation and Air Quality (CMAQ) Emissions Analysis Techniques* report. This project was part of an overall effort to bring together the tools and techniques used by States and Metropolitan Planning Organizations (MPOs) to assess the emission reduction potential of prospective CMAQ funded projects.

The report describes modeling tools and other methods that can be used to assess the emissions benefits of transportation control

measures and related projects when applying for CMAQ funds. The report is primarily intended for State or local air quality/transportation program analysts, as well as for others interested in estimating the emissions benefits of CMAQ projects.

A brief overview of 19 forecasting methods is provided, including pre-packaged and customizable software tools, worksheets, and procedures for calculating benefits. They collectively address a wide range of potential CMAQ projects, including travel demand management, traffic flow improvements, and vehicle fuel technology strategies. The report also includes references to other sources of information on CMAQ program effectiveness.



The report is available on the FHWA Office of Planning and Environment Web site at www.fhwa.dot.gov/environment/tcm.htm. If you have any questions regarding the publication, please contact Diane Turchetta at (202) 493-0158 or Victoria Martinez at: **Victoria Martinez** (787) 766-5600, ext. 231 victoria.martinez@fhwa.dot.gov

TECHNOLOGY TRANSFER

New Law Encourages Cooperation

On November 1, a new law was enacted that will help ensure that the benefits of Federal research translate into new products and opportunities for the American public. Called the Technology Transfer Commercialization Act of 2000, the law simplifies the process of licensing Government-owned inventions to the private sector by allowing the licensing of pre-existing inventions that arise under Cooperative Research and Development Agreements so that the private sector partner has

access to the relevant technology. The Act also authorizes Federal agencies to acquire rights in related privately owned inventions, so as to create a more effective portfolio for licensing.

The Act will remove procedural obstacles to technology transfer and directs agencies to consider the increasingly international environment of innovation. It recognizes that, in many cases, the necessary period for notice by a Federal agency of its intent to grant exclusive licenses can be

shortened using both traditional and electronic means for providing the notice (15 days minimum). In making decisions about appropriate notice periods, Federal agencies must continue to balance the need for promptness against the fundamental statutory purpose of ensuring that these inventions are used in ways that benefits the public.

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Growney Awarded For Instrumental Role as Knowledge Manager

In September 2000, Jim Growney received a letter of appreciation for his work as initial Knowledge Manager for FHWA's successful Rumble Strip Community of Practice (CoP). Tony Kane, Fred Hempel, and Mike Burk awarded the letter to Growney at the first meeting of FHWA's Knowledge Management Employee Advisory Committee.

Knowledge Management is a concept that has been used for the past several years by a variety of organizations in both the public and private sectors. In traditional organizations, knowledge tends to flow along organizational lines, from the top down. But that pattern seldom results in making knowledge available in a timely fashion and where it's needed the most. In organizations with managed knowledge, information can flow across organizational lines, reaching the people who can use it in ways that best promote the organization's goals and that enhance service to the customer at the same time.

There are four basic elements of the knowledge management cycle: find/create, organize, share, and use/reuse. Under "find/create," especially as it operates in a transportation organization, knowledge is gained through a variety of means, including publications, conferences and meetings, project experiences, research, and industry expertise. In the next step of the cycle, "organize," the knowledge is filtered and catalogued, and links to the outside are created for easy access. Then the information is shared for wide availability,



From l to r: former FHWA Executive Director Tony Kane, Highway Safety Engineer Jim Growney, Knowledge Office Chief Mike Burk, and former Corporate Management Director Fred Hempel celebrating Growney's award.

making use of high-tech computer tools such as the Internet and other techniques such as conferences, journal articles, and the natural communication channels created in a collaborative work environment.

In the final stage of the knowledge management cycle, "use/reuse," the knowledge is applied and reapplied to address real-world problems and issues. This involves both informal contacts and access to reports, good practices, success stories, and other forms of communication, including exhibits, demonstrations, and training sessions. Much of this knowledge can be made available to a wide audience through the Internet.

To help carry out the "organize" and "share" functions in a specific community of people having a common interest, many experts recommend a knowledge manager. This person has the task of soliciting good practices, indexing and cataloging new information as it

comes in, and serving as an information broker by helping people obtain the information they need. The knowledge manager can also serve as an advocate for knowledge-sharing practices within and beyond his or her specific community of practice.

During his 1½ years as knowledge manager for the Rumble Strip CoP, Growney was instrumental in facilitating the community and keeping relevant information on the site. For his contribution, Growney also received a framed certificate and a desk clock with the inscription "I took the time to share."

To view the Rumble Strip CoP Web site, visit <http://safety.fhwa.dot.gov/programs/rumble.htm>. Additional information on knowledge management can be obtained by contacting:
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Innovations Deserving Exploratory Analysis (IDEA)

The IDEA Programs explore the feasibility of new concepts for solving transportation problems. These can involve innovative products, techniques, or procedures that can be entirely original or may be adapted for transportation from practices in other fields.

IDEA projects address critical issues that impact safety or efficiency in four general areas of interest to the DOT agencies. Three of the programs are modally-based: Highway (NCHRP)-IDEA, Transit-IDEA, and High Speed Rail (HSR)-IDEA. These are supported by State DOT and Federal funds through the National Cooperative Highway Research Program, FTA funds

through the Transit Cooperative Research Program, and FRA funds respectively. The fourth program has a multi-modal focus that was based on ITS in the past, under the sponsorship of FHWA, NHTSA, and FRA. It is now being replaced by a new program based on safety technology under FMCSA and FRA sponsorship.

The IDEA Program solicitation, on the Web at www.nationalacademies.org/trb/idea, describes focus areas in which solutions are needed and invites academics, inventors, businesses, and agencies to propose solutions. This allows maximum freedom for almost anyone to submit their innovations and creative approaches to one or more

of the programs for evaluation and possible funding. Every six months project selections are made from the proposals that have been submitted with between 10 and 20 percent being selected. Committees made up of DOT modal agency liaisons, experts from State and municipal "user" agencies, university professors, and technical managers from private industry govern the IDEA programs and select the projects. The program is administered by the Transportation Research Board, where Keith Gates (kgates@nas.edu, 202-334-3724) is the program coordinator and contact person.

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PROFESSIONAL DEVELOPMENT

International Scan on Workforce Development

The planning for a major international scan, co-sponsored by FHWA and AASHTO, is now underway. Joe Toole, director of the Office of Professional Development, and Pete Rahn, secretary of transportation for New Mexico, are co-chairs of the 10-person study panel. Composed of representatives from FHWA, AASHTO, academia, professional associations, and the private sector, the panel has scheduled site visits in Europe to study innovative and workable practices in the transportation field.

Topics to be addressed by the scan are workforce development and transportation training. Discussion

topics include European practices and experiences related to partnerships, education, and workforce development. Specifically, the panel will explore the methods used by other countries to recruit, train, and retain their transportation professionals at all levels (apprenticeship, undergraduate, graduate, management, and executive). U.S. participants will share their viewpoints and experiences with the hope of forging new partnerships between comparable American and European agencies and institutions.

According to panel co-chair Joe Toole, "The members of the scanning tour are excited about learning how public and private

highway organizations in Europe have been able to build and maintain a dedicated, trained workforce of technical and nontechnical staff. We are eager to learn what has worked and apply these ideas in the United States."

The panel is scheduled to conduct their meetings and site visits between March 24 and April 8. Tentatively, plans are underway to meet in Sweden, Germany, France, and the United Kingdom. A preliminary summary of the scan findings should be available by June 2001.

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NHI Course Catalog Now Available

The National Highway Institute *Transportation Training Resources Catalog* 2001 is now available. This publication includes NHI courses and workshops offered by FHWA program offices and resource centers. It also includes surface training programs provided by other non-profit organizations. The catalog is available for the first time this year as a CD-ROM. For

copies of either the book or the CD-ROM contact Conni Morse at (703) 235-0534 or conni.morse@fhwa.dot.gov.
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NHI's 2001 Transportation Training Resources Catalog is now available for the first time on CD-ROM.

